

Disease of Wild Canines II

Foot-and-mouth disease virus

- Foot-and-mouth disease is a highly contagious acute febrile viral disease typically affecting cloven-hoofed livestock and characterized by vesicular lesions in the mouth and on the feet.
- *Foot-and-mouth disease virus* (FMDV; order *Picornavirales*, family *Picornaviridae*, genus *Aphthovirus*)
- contagious and difficult to control
- FMD is the most economically significant veterinary disease in the world.

Foot-and-mouth disease virus

- While all members of the order *Artiodactyla* are thought to be susceptible to FMD, domestic cloven-hoofed livestock species, including cattle, pigs, sheep, and goats are considered the most significant hosts due to their role in the epidemiology of the disease.

Foot-and-mouth disease virus

- African buffalo (*Syncerus caffer*) play an important role as persistent carriers, and other African wildlife species including greater kudu (*Tragelaphus strepsiceros*) and impala (*Aepyceros melampus*) are thought to play a role in maintaining the disease.
- A range of other wildlife belonging to order *Artiodactyla* are known to be naturally susceptible, but are not considered epidemiologically significant hosts under natural conditions.

Foot-and-mouth disease virus

- There are reports of natural infection with FMDV in several non–cloven-hoofed wildlife species including
 - Asiatic **elephant**
 - African **savannah**
 - European **hedgehog**
 - Eastern gray **kangaroo**
 - Brazilian tapir and **Asiatic tapir** and **brown bear**.
- *With the exception of free-ranging hedgehogs infected with FMDV in the vicinity of an outbreak in cattle, all other cases were small numbers of captive animals.*
- A range of non–cloven-hoofed species have been **experimentally** infected with FMDV, including **rodents, rabbits, moles, armadillo, hedgehogs, squirrels, marsupials, monotremes, reptiles, primates, birds, cats, and dogs.**
- There is a previous report of suspected FMD in **Asiatic black bears**, where the diagnosis was based on clinical signs and was not confirmed.

Equine herpesviruses

- *EHV* can infect polar bears
- Infection by equine herpesvirus (EHV) strains (EHV-1, EHV-9) in ursid species, **including polar bears (*Ursus maritimus*)**, has been associated with neurological disease and death
- Clinical signs increased in frequency and severity, including *circling* and *partial seizures*, consisting of uncontrolled *asymmetric muscle fasciculations* and *opisthotonus*.

Equine herpesviruses

- Microscopic examination revealed **severe nonsuppurative meningoencephalitis**, predominantly in the grey matter of the cerebrum.
- The **rostral telencephalon**, particularly the **rhinencephalon**, was the most significantly affected region of the brain.

Equine herpesviruses

- Inflammatory cells consisting of
 - lymphocytes,
 - plasma cells,
 - macrophages, and
 - fewer eosinophils
- formed **perivascular cuffs** within the meninges overlying the brain and Virchow-Robin spaces within the parenchyma, as well as more poorly delineated inflammatory cell infiltrates within the subjacent meninges, neuropil, and neuroparenchyma .

Equine herpesviruses

- Microglial cells exhibited nuclear rod-shaped elongation (reactive microglia), **satellitosis**, and **neuronophagia**.
- Within the nuclei of neurons and astrocytes, there were smudgy to distinct basophilic to *amphophilic intranuclear inclusion bodies* with chromatin margination and occasional clear space around the inclusion bodies (diffuse type and **Cowdry type A inclusions**).

Exertional Myopathy (Capture myopathy)

- Exertional myopathy (EM) is a **noninfectious disease** of animals characterized by *degenerative or necrotizing damage* to skeletal and cardiac muscles associated with physiologic imbalances after **extreme exertion and stress**
- The disease has been documented in **red fox, North American river otter, mountain lion, coyote, badger, and black-footed ferret.**